

Serial No. 10/523,627

Office Action dated: 04/10/2006

Response to Office Action dated: 07/10/2006

### AMENDMENTS TO THE CLAIMS

Please replace all previous versions of the claims with the following listing:

1 – 5. (Cancelled)

6. (Previously Presented) A gas fuel supply system for supplying gas fuel to an internal combustion engine, comprising:

a fuel supply passage for supplying the gas fuel to an injector; and  
source pressure control means for controlling pressure of the gas fuel supplied to the injector through the fuel supply passage by using negative pressure in an intake pipe such that the pressure of the gas fuel increases if the negative pressure in the intake pipe decreases, and the pressure of the gas fuel decreases if the negative pressure in the intake pipe increases.

7. (Previously Presented) The gas fuel supply system as defined in claim 6, wherein the injector is provided in the intake pipe.

8. (Previously Presented) The gas fuel supply system as defined in claim 6, wherein the source pressure control means comprises a diaphragm type regulator provided in the fuel supply passage, and a negative pressure supplying passage which connects a diaphragm chamber of the regulator to the intake pipe.

9. (Previously Presented) The gas fuel supply system as defined in claim 8, wherein a throttle valve is provided in the intake pipe for adjusting an amount of intake air, and the negative pressure supplying passage connects the diaphragm chamber of the regulator to a downstream side of the throttle valve in the intake pipe.

10. (Previously Presented) The gas fuel supply system as defined in claim 9, wherein the regulator is a two-stage type regulator comprising a high-pressure regulator and a low-pressure regulator disposed at a downstream side of the high-pressure regulator, and the negative pressure supplying passage connects

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respective diaphragm chambers of the high-pressure regulator and the low-pressure regulator to the intake pipe.

11. (Previously Presented) The gas fuel supply system as defined in claim 9, wherein the regulator is a two-stage type regulator comprising a high-pressure regulator and a low-pressure regulator disposed at a downstream side of the high-pressure regulator, and the negative pressure supplying passage connects a diaphragm chamber of the low-pressure regulator to the intake pipe.

12. (Previously Presented) The gas fuel supply system as defined in claim 9, wherein the regulator comprises a valve element for opening and closing a passing hole for the gas fuel, a diaphragm to which the valve element is connected, a decompression chamber defined in a front side of the diaphragm for receiving the gas fuel which passes the passing hole, a diaphragm chamber defined in a back side of the diaphragm, and an adjustment spring for urging the diaphragm in such a direction that the valve element opens the passing hole, wherein pressure in the diaphragm chamber acts to move the valve element in an opening direction, and pressure in the decompression chamber acts to move the valve element in a closing direction.

13. (Previously Presented) The gas fuel supply system as defined in claim 6, wherein the source pressure control means comprises a flow rate control valve which is provided in the fuel supply passage and comprises a valve element for opening and closing a passing hole for the gas fuel, a negative pressure receiving part connected to the valve element, a negative pressure applied chamber defined in a back side of the negative pressure receiving part, and an adjustment spring for urging the valve element in a closing direction, wherein the pressure in the negative pressure applied chamber acts to move the valve element in an opening direction, and a negative pressure supplying passage connects the negative pressure applied chamber of the flow rate control valve to the intake pipe.

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14. (Previously Presented) The gas fuel supply system as defined in claim 13, wherein a throttle valve is provided in the intake pipe for adjusting an amount of intake air, and the negative pressure supplying passage connects the negative pressure applied chamber of the flow rate control valve to a downstream side of the throttle valve in the intake pipe.

15. (Previously Presented) The gas fuel supply system as defined in claim 14, wherein a regulator for decompressing the pressure of the gas fuel to a predetermined pressure is provided in the fuel supply passage, and the flow rate control valve is provided in a downstream side of the regulator in the fuel supply passage.

16. (Currently Amended) A gas fuel supply system comprising:  
a regulator for decompressing gas fuel and supplying the decompressed gas fuel to an injector provided in an intake pipe of an internal combustion engine; and  
a throttle valve provided in an upstream side of the injector in the intake pipe,  
wherein the regulator comprises:  
a valve element for opening and closing a passing hole for the gas fuel;  
a diaphragm to which the valve element is connected;  
a decompression chamber defined in a front side of the diaphragm for receiving the gas fuel which passes the passing hole;  
a diaphragm chamber defined in a back side of the diaphragm;  
and  
an adjustment spring for urging the diaphragm in such a direction that the valve element opens the passing hole,  
wherein pressure in the diaphragm chamber acts to move the valve element in an opening direction, and pressure in the decompression chamber acts to move the valve element in a closing direction,  
wherein the diaphragm chamber of the regulator is connected to a downstream side of the throttle valve in the intake pipe, such that the pressure of

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the gas fuel increases if the negative pressure in the intake pipe decreases and the pressure of the gas fuel decreases if the negative pressure in the intake pipe increases.

17. (Previously Presented) A method for supplying gas fuel to an injector of an internal combustion engine having a throttle valve for adjusting an amount of intake air which is provided in an intake pipe, comprising a step of controlling pressure of the gas fuel supplied to the injector by using negative pressure in the intake pipe which is generated in a downstream side of the throttle valve such that the pressure of the gas fuel increases if the negative pressure in the intake pipe decreases and the pressure of the gas fuel decreases if the negative pressure in the intake pipe increases.